

COMPARATIVE STUDY ON THE INCIDENCE OF MASTITIS DURING DIFFERENT PARITIES IN COWS AND BUFFALOES

S.C. Jingar*, R.K. Mehla, Mahendra Singh, Ajesh Kumar,
S.C. Kantwa and Navav Singh

Livestock Production Management
National Dairy Research Institute, Karnal- 132 001 India

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ABSTRACT

The data was collected for the twelve years period to find out the effect of parity and breed on incidence of mastitis. The parity number significantly influenced mastitis incidence in indigenous ($P < 0.05$) and crossbred cows ($P < 0.01$) but in Murrah buffaloes the effect was non-significant. The mastitis incidence was lower in first parity than the rest of parity and increased with increase in parity number. Incidence of mastitis was also influenced by breed and was maximum in crossbred cows in comparison to indigenous cows and Murrah buffaloes. It was concluded that increase in parity result in increased incidence of mastitis in cows and buffaloes and the differential incidence was due to breed effect in the same parity.

Key words: Breed, Buffaloes, Cows, Mastitis, Parity.

INTRODUCTION

Mastitis is a multi-etiological complex disease characterized by inflammation in parenchyma of mammary glands and physical, chemical and bacteriological changes in milk (Radostits *et al.*, 2000 and Sharma *et al.*, 2012). Mastitis adversely affects animal health, and economics of milk production of dairy herds in developing and developed countries (Sharma *et al.*, 2007). The losses due to mastitis are not only economic, but issues such as animal health and welfare, milk quality, antibiotic usage and the image of the dairy sector are important reasons to focus on mastitis control. Considerable information on effect of parity on mastitis incidence is available in exotic cows but comparative information of different breeds at farm level is lacking (Biffa *et al.*, 2005). The present investigation was undertaken to investigate the effect of parity and breed on incidence of clinical mastitis in crossbred and indigenous cows and Murrah buffaloes.

MATERIALS AND METHODS

The data were collected from history sheets, stock registers and health record registers maintained in different sections of the institute for a period of twelve years (2000-2011). The experiment was

conducted during 2012-13 at National Dairy Research Institute, Karnal. The climate of the farm is subtropical in nature. The lowest temperature falls to 2°C during the winter months, whereas highest temperature goes up to 45°C during the summer. The annual rainfall is about 760 to 960 mm, out of which most of the rainfall is received during the months of July and August. The relative humidity ranges from 41% to 85%. Lactation records (6251) comprising Karan Fries (2553), Karan Swiss (351) Sahiwal (1554), Tharparkar (323) cows and Murrah buffaloes (1470) were classified according to breed and parity *viz.*, I, II, III, IV, V, VI and above. The effect of breed and parity factor was estimated on mastitis incidence by chi-square method (Snedecor and Cochran, 1994). The association between two variables were studied using Chi-Square statistics;

$$\text{Chi-square} = \sum (O - E)^2 / E \text{ Where,}$$

O= Observed frequencies; E= Expected frequencies, Expected frequencies were calculated as:

$$E_{ij} = (R_i) (C_j) / GT$$

Where,

E_{ij} = Expected frequency belong to i^{th} row and j^{th} column
 R_i = i^{th} row total; C_j = j^{th} column total; GT = Grand total

*Corresponding author's e-mail: sureshjingar@yahoo.in

RESULTS AND DISCUSSION

The incidence of mastitis in Karan Fries, Karan Swiss, Sahiwal, Tharparkar cows was 36.90%, 38.46%, 33.98% and 33.44%, respectively (Table 1). The incidence of mastitis increased with the increase in parity order and ranged between 30.29 to 46.31%, 35.96 to 42.11%, 31.69 to 43.11% and 24.39 to 45.00 % in Karan Fries, Karan Swiss, Sahiwal and Tharparkar cows during different parities. The incidence was highest in fourth parity and above and lowest in first parities in different breeds, except KF cows. The incidence was the highest in sixth & above parity (41.31%) and lowest in the second parity (20.94%) in Karan Fries cows whereas in Karan Swiss cows, the highest and lowest incidence was in fourth (42.11%) and first parity (35.96%). Mastitis incidence in Sahiwal and Tharparkar cows was maximum in sixth & above parity (43.11%) and fifth parity (45.00%) and minimum in first parity (31.69% and 29.06%). The increased incidence of mastitis with increased parity suggests multiparous cows being consistently suffer more severe yield losses than primiparous cows due to higher milk yield (Wilson *et al.*, 2004) as effectiveness of streak canal as barrier to infection decreases (Khate and Yadav, 2010).

The incidence of mastitis in crossbred cows observed in this study corroborates similar per cent incidence of clinical mastitis reported by various researchers in crossbred cows (Mukherjee *et al.* 1993; Chand and Behra, 1993; Sharma 2010). The contradictory results of high and low incidence in crossbred cows were due to different management practices (Roy *et al.*, 1993; Singh *et al.*, 2001; Khan and Muhammad, 2005; Girma, 2010). Higher per cent incidences of clinical mastitis have been reported in Sahiwal and Tharparkar cows (51.3 and

46.1 per cent) by Mohanti (1979) and lower per cent incidence was reported by various workers (Roy *et al.* 1993; Chand and Behra, 1993; Pal, 2003; Chishty *et al.*, 2007; Ali, 2009; Khate and Yadav, 2010). In this study the incidence of mastitis was low and ranged between 5.96 to 27.9% in indigenous cows and corroborates to a range of 8-46% in buffaloes (Dhakal and Thapa, 2002; Shinde *et al.*, 2001; Pal, 2003; Taraphder, 2006; Khate and Yadav, 2010). A non-significant effect of breed on the incidence of clinical mastitis have also been reported in Haryana purebred, HF crossbred, Brown Swiss crossbred and Jersey crossbred cattle (Sethi and Balaine, 1978). The breed effect in this study could probably be due to different shape and size of teat and the manner of attachment of udder. Large size udder and increased rate of milk flow influence the occurrence of mastitis (Khan and Muhammad, 2005). The significant variation of mastitis incidence between Sahiwal and Murrah might therefore primarily be of genetic origin in this study. The pendulous udder and loose teat sphincters in Sahiwal could be an important factor in this aspect (Khate and Yadav 2010).

The overall incidence of clinical mastitis was significantly less ($P < 0.05$) in Murrah buffaloes than the cows. In Murrah buffaloes the incidence of mastitis was 26.26% and increased from 22.78 to 32.89% during different parities. In Murrah buffaloes incidence of mastitis was more in fourth parity (32.89%) and less in first parity (22.78%). A significant effect of parity on clinical mastitis ($P < 0.01$) was observed in Karan Fries and Sahiwal cows ($P < 0.05$), while effect was non-significant in Murrah buffaloes, Tharparkar and Karan Swiss cows. A significant effect ($P < 0.01$) of breed on incidence of mastitis was found in cattle vs. Buffaloes ($P < 0.01$),

TABLE 1: Incidence of clinical mastitis (%) in various breeds of cattle and buffaloes in different parities

Effect	Breed									
	Karan Fries		Karan Swiss		Sahiwal		Tharparkar		Murrah Buffaloes	
	No.	Mastitis	No.	Mastitis	No.	Mastitis	No.	Mastitis	No.	Mastitis
Overall	2553	36.90 (942)	351	38.46 (135)	1554	33.98 (528)	323	33.44(108)	1470	26.26(386)
Parity										
First	827	31.44(260)	89	35.96(32)	426	31.69(135)	117	29.06(34)	474	22.78(108)
Second	581	30.29(176)	77	36.36(28)	371	33.96 (126)	67	37.31(25)	351	25.36(89)
Third	397	42.57(169)	50	38.00(19)	217	41.01(89)	41	24.39(10)	238	25.21(60)
Fourth	270	44.81(121)	38	42.11(16)	190	32.63(62)	30	43.33(13)	152	32.89(50)
Fifth	180	43.33(78)	32	40.63(13)	124	35.48(44)	20	45.00(9)	95	30.53(29)
Sixth & above	298	46.31(138)	65	41.54(27)	167	43.11(72)	48	35.42(17)	160	31.25(50)

No. = Number of observations; Figures in parentheses indicate the number of observation of mastitic animals

crossbred vs. indigenous cows ($P < 0.01$), crossbred vs. buffaloes ($P < 0.01$) and indigenous cows vs. buffaloes ($P < 0.05$) suggested breed effect on mastitis incidence and corroborates to the earlier report of significant effect of breed on mastitis incidence in cows and buffaloes (Sori *et al.*, 2005; Khate and Yadav, 2010; Sharma, 2010). Further, decreasing trend of mastitis in order of KS, KF, SW, TP cows and Murrah buffaloes, confirmed that buffaloes possess superiority in terms of resistance to mastitis and the crossbred cows were more susceptible to mastitis owing to position of teat and udder and anatomy of teat canal and due to less efficacy of cells in high yielding cows. (Sori *et al.*, 2005). The comparative high resistance of buffaloes to intra-

mammary infection may be possibly owing to tightly closed teat orifice due well developed circular muscles thick stratified squamous keratinized epithelium of streak canal lining which provides an extra resistance against penetration of pathogens than cows. These keratohyaline granules contribute in formation of large amount of keratin in lumen of streak canal (Sharma *et al.*, 2012).

CONCLUSION

From the study it was concluded that buffaloes were more resistance to mastitis as compared to cows. Further, increase in parity number leads to increased incidence of mastitis in both cows and buffaloes.

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